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THE

T-EATING HABIT;

ITS EFFECT ON THE

ANIMAL ORGANISM IN HEALTH AND DISEASE.

A CONTRIBUTION TOWARD THE STUDY OF

THE RATIONAL FOOD OF MAN.

BY

RICHARD T. COLBURN,

NEW YORK.

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1878

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THE SALT-EATING HABIT;

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THE SALT-EATING HABIT.

BY R. T. COLBURN.

WHEN I learned from Dr. James C. Jackson that salt was not food, and was for the most part not beneficial, but hurtful to the human body, I was struck with amazement and incredulity. My course of reading, and indeed my reasoning, had led me to adopt the prevailing views about it. As is my habit, the doubt being once raised, I determined to investigate the subject; and meanwhile, as I was a very sick man, and there were abundant evidences around me that it could be done without apparent danger, I abandoned the use of salt totally, along with other condiments considered hurtful in my case. My first step was to re-examine the text-books and works on dietetics to see what had been written, and what was known about it. Of course, I found that, with the exception of two or three of the more recent writers of the Hygienic or Reform School of medicine, the "authorities," as they are called, were all, or nearly all, so far as they said anything on the point, in favor of its use. At the same time I could not help feeling that a subject of such gravity and daily concern had been almost overlooked, and certainly had nowhere had the research and study it deserved. It was no surprise, however, to find the more intelligent discussion of the subject in the ranks of what I may call the "Nature School" of physicians, and to see the traditional "Old School" professors accept the old theories as if they were settled. The arguments in favor of salt-eating, as found in the books, may be summarized thus:

1. It is natural to man, the habit being universal.
2. It is necessary to life. Human beings deprived of it die.
3. Wild and domestic animals crave and seek it.
4. It is an invariable constituent of the solids and fluids of the body; hence it must be supplied.
5. Cattle, when fed it, increase greatly in weight, so that if not itself food, it may take the place of food by making it "go further."

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6. It retards the waste of the system, and in this way may prolong life.

7. It is essential to promote the secretion and flow of saliva and bile.

8. It promotes appetite by rendering the food more palatable.

I remember no single authority which makes use of the whole of these positions; but Flint and Draper, as representing the latest and boldest of the so-styled scientific teachers of physiology, enumerate most of them. I think it will be admitted that I have not diminished their force, nor misrepresented them.

If this were merely a question of "authorities," that is of writers whose views have secured more or less notice, there would hardly be room for controversy. It happens that in Physiology there are no authorities whose dicta are not subject to review or reversal. The history of the science affords many instances where the most orthodox and venerable teachings have been set aside and consigned to the limbo of stupid errors; nor is there any natural presumption that we have seen the last of our mistakes. Unless we are ready to adopt the doctrine of a degeneracy of the race of men, we are bound to assume that what has been done by other men, in other times, may be done by men again. The opportunities and aids to the senses of to-day are better, and the reasoning faculties for the discovery of truth are as good. There is nothing in the written opinions of those who have gone which is so sacred as not to be discussed; otherwise progress is impossible, and it is by testing afresh every traditional dogma that progress has been made, both in the exact and speculative departments of knowledge.

To say, therefore, that salt-eating is not hurtful, simply because the weight of authorities is in favor of it—while it may answer as a rule of practice for those who have neither time nor inclination to convince themselves one way or the other—is no reason why the subject should not receive such an analysis, as if there had never been an opinion given on it. Here let me say that I neither propose nor expect to convince anybody of the correctness of my conclusions—that is something each one must do for himself. The utmost I can do is to stimulate the inquiry in other minds, and to testify that the best, the personal experiment to solve the question may be made not only without danger, but also with pleasure and profit. To such earnest minds it is sufficient to indicate the following outline of research, the support for which may be found in the ordinary text-*books printed in the* English language.

The first three of the above propositions constitute what may be styled the prescriptive or old-fashioned argument. The next four, grouped together, are the chemical theory of the value of salt, and are of more recent origin. The last, though seldom advanced as a scientific reason, partakes of the character of science as well as of tradition.

In regard to No. 1, let us see how far it is borne out. To destroy logically the value of the proposition it would only be necessary to establish of a single individual that he does not and has not used salt—raw salt—in his food. The universality, being what it rests on, would then be broken. We ought not to be content with that however. I think it would not be difficult to show that there are whole nations and tribes of people who do not eat salt. I am told by an Italian, who has lived among them, that the Algerines do not. I was myself informed while in the region that the Indian tribes inhabiting the banks of the Columbia River and Puget Sound do not. It is noteworthy also that those tribes are among the most peaceful, intelligent and industrious tribes in North America, and are fine in personal appearance. I think there is little doubt that the inhabitants of the islands of the Pacific Ocean lived from a period of vast antiquity, until their discovery by Europeans, without putting salt crystals on their food. It has continually happened that hunters, tourists, soldiers and explorers have been left for weeks, months and years without a supply of salt, by accident or otherwise, and have survived without apparent injury. Finally, there are many persons in the United States who have voluntarily abandoned the use of salt for periods ranging from one to twenty years (and for aught I know longer), not only without injury but with increased health, strength and activity. So far from being natural to man, the instincts of children, especially when born free from an inherited bias in its favor, go to show by their rejection of it that it is *un*natural. Like the taste for coffee, tea and various seasonings, it is an acquired one; few if any children but will prefer unsalted food.

It should not be overlooked that the manufacture and distribution of salt as an article of commerce is a thing of history, and has attained its enormous dimensions within the past century and a half. It is inconceivable that in past times the population of the world, made up as it was largely of pastoral and nomadic people inhabiting the interior of the great continents, should have supplied themselves with salt as an ingredient of food, as we do. The omission of any mention of it in the older chronicles and even among the more

perfect records of the classics, except at the luxurious tables of the rich, goes to confirm this supposition.

Propositions Nos. 2 and 3 are of the same character, and have their origin. It is discouraging to discover how little thorough sifting of beliefs there is among mankind—especially concerning matters of such primary importance as their daily diet—a neglect for which their hair-splitting casuistry on topics of faith and morals in no way atones. The foundation for the notion that men die when deprived of salt, and the inference therefrom that it is because of it), so far as I have been able to trace it, rests on an experience related in the older works on physiology, and copied with child-like confidence into the later ones, to the effect that, more than one hundred years ago, during the wars waged by England on the Continent, several thousand British soldiers, being shut up as prisoners of war in the low countries—at the Hague, I believe—and after an incarceration of many months, all died of disease, induced, it is stated, by being deprived of salt! The same cry, it will be remembered, has been charged upon modern nations in more recent wars, and notably during our own civil conflict, when the mortality was so great in the southern prisons. It needs no great natural acumen nor book learning to discover that there are other and far more potent disease-inducing causes at work to account for the dreadful mortality—even in these days of superior civilization and greater humanity. Observation, and a personal experience in Southern * war-prisons, satisfies me that inattention to ordinary sanitary precautions—partly incident to confinement and partly to the rooted superstition in the minds of those who have charge of them, that disease is a something to be fought out with specific medicines after it has appeared, rather than prevented from making its appearance—will abundantly reconcile the facts, if they are facts; and in this I am confirmed by a comparison of the appalling ratio of mortality recorded in some of the most famed of London and Paris hospitals, where gangrene and fevers alone did their deadly work, in spite of the attentions of doctors, without appreciable aid from those inevitable attendants of war-prisons—homesickness, filth, and bad diet. Such evidence as this would hardly be received in a trial for larceny; and yet it is solemnly repeated generation after generation by those who should be teachers of teachers.

* Fact. You are probably not aware that I was a prisoner of war in "Libby" and other prisons.

The third proposition, in regard to the wild and domestic animals, is, like the preceding, not formidable when examined. I have diligently inquired of old hunters and pioneers for confirmation of the story that deer and buffalo are in the habit of visiting regularly the salt springs or "licks," in order to eat the salt. I have not been able to find one who has ever seen the licking process himself. There is reason to believe that hunters do take their positions at certain brine-springs to find their game, and that the deer at certain seasons of the year resort to them—precisely why is not determined. Nothing of the kind is now claimed of the buffalo; that is a tradition. But suppose it were all true, as claimed, does that justify man in sprinkling the solid residue of the brine on his food? Is here not vastly too lofty a structure for so slight a foundation? It is notorious that all the salt springs hold in solution (sometimes found encrusted on their sides) large amounts of lime, sulphur, iron, and commonly other ingredients.

The very purest of our table salts of commerce contain from two to four per cent. of the sulphate of lime, after they are supposed to have been purified and larger amounts of it removed. May it not be that at certain seasons, as in the winter when the herbage is covered by snow, or during pregnancy, when the fœtus requires it, the deer (or buffalo, if you will) repair to these spots instinctively for that which nature denies them at the time? We know that cows on a scant pasture, at such times, will chew and partly dissolve an old bone; yet it would be equally reasonable to put ground bones on our food as an inference from this trait; indeed more so, as the latter is an admitted fact of every day occurrence, while the other is somewhat in doubt; and besides the economy of lime in the system is patent.

In regard to domestic animals we are on more solid ground; only it is constantly necessary to remember that we are dealing with creatures domesticated, and subdued in some degree to the will of man. It is a common notion that salt is necessary to the well-being, if not the preservation, of horses and horned cattle. It is, I am persuaded, a great mistake. In the first place, although it is undoubtedly true that some domestic cattle will eat salt, and follow impatiently to get it, it is not true of wild cattle. I am assured by many of the great herders in Texas, Colorado and California, that the native cattle are not fed salt, never see it, and will not eat it if offered. Of course it is a transparent absurdity that salt could be hauled hundreds of miles to feed *these great* inland herds; and it is not done, as is supposed.

They derive salt enough from the grass of the plains to supply nature's demand if any there be. This, if it furnishes any analogy at all, points to the food itself as the true source of supply for the human species.

But in regard to the craving of the horses and cows kept within fences, enclosures and buildings, it is susceptible of proof, and has been proved many times, that it is an artificial and not a natural state. I have both horses and cows who do not and will not eat salt if offered to them. The parents, when I cut off the supply, did not suffer perceptibly, and in a short time unlearned the habit. Neither the old ones nor their progeny will touch it now. I may remark also that while my neighbors have been afflicted with murrain distemper among their cows, and epizootic and the like among their horses, mine have escaped. I do not pretend, however, that this is owing wholly to the absence of salt, although that is the opinion of many with whom I have compared notes, and who disuse salt; but I am firmly of the opinion that the administration of so much of it, ostensibly as food, tends to induce such diseases, as well as foot-rot in sheep, and when induced it makes recovery more tardy and doubtful. The fact that my stock get more or less fruit may assist in promoting their uniform health. I have not space here to enter into the question of the great injury done to the health, and consequently to the wholesomeness of the flesh of both improved and native or Texas varieties of cattle, by the pernicious practice of thrusting salt into their food, while preparing for or on the way to market, in order that the weight may be increased. It is worth the while of the State to institute an inquiry to see if this be not one of the provoking causes of the cattle diseases and rinderpests of this country and Europe.

The tendency in the human mind—the more so with the untrained intellect—to find the class of facts it is seeking for, and to overlook or ignore the class which makes against its preconceived notion or desire, is always to be guarded against. It is a little singular that the advocates of the salt habit should have selected the one or two species of wild animals, and the two or three allied species or varieties under domestication which do or can be made to eat salt, while the vastly greater number of both classes of animals which do not and cannot be made to, are overlooked. True enough, a hungry cow will eat what is called "salt hay," whereon the brine from the sea has crystalized, but invariably the same cow will turn from it to good well-cured meadow hay. Hunger is a terrible temptation, *hence many of our animals* (and the same is true of children) acquire

their taste for salt by its mixture with their food; and a reprehensible practice has begun of mixing salt, or lime, with the new hay in the stack in order to "cure" it; that is to prevent its decay by excess of moisture, on the theory that the hay is improved thereby. Surely no argument can properly be drawn from appetites so engendered. On the same principle might we sprinkle saw-dust with a horse's oats, because, if kept up, he will gnaw away the boards within reach. For this, by the way, there is good physiological ground.

Look, however, at the other side of the argument as drawn from the lower animals. How numerous are they by whom salt is rejected or to whom it is hurtful? The whole of the birds avoid salt. It is fatal to chickens and tame birds as every housewife knows. Indeed, there is strong ground for supposing that much of what is called "chicken cholera," "gapes," and the like, is in part due to the presence of salt—not always in minute quantities—in the food taken from the table. Wild birds have no such epidemic diseases affecting the mucous linings of their organs. It is also fatal to the hog, that foulest and hardiest of omnivora, which, out of some stress of famine, or from its peculiar prolificacy, men have been led to dwell with and propagate as a food supply. I believe it is well ascertained that when hogs get a moderate amount of brine, or pickled salt meat, it is impossible to save them. To vary the phrase a little: that which will make a hog sick can't, *prima facie*, be good food for his owner. Of all the range of wild animals, clean or unclean, it is yet to be shown that a single one eats salt voluntarily as food. Why should man be the exception?

The study of Comparative Physiology, which has of late years illuminated some of the obscure corners of Human Physiology, may be of use when rightly read, and so far Dietetic Reform has nothing to fear from its further prosecution.

I can find, then, very little support for the use of salt in the common knowledge or transmitted opinions on the subject. Not being, like some other matters of belief, a thing depending on the integrity of tradition, it cannot be established that way. Because our fathers have (from time immemorial, let us say) done so, it is not a sufficient reason why we should still do so, nor a reason why we should forbear to ask ourselves, "is it beneficial to do so?" If it is to be justified, it must be upon the other grounds, viz: that it is necessary to the processes of the body (or at the least advantageous to them), or that it is pleasant to the senses and harmless to the health. Let us see *how the plea fares* under the hands of science.

It is found by repeated analysis of the human body, that in a corpse weighing, say 130 to 150 pounds avoirdupois, there are contained from 300 to 400 grains of chloride of sodium, the pure salt, to which our common salt is an approach. Along with it are usually found a considerable quantity of lime, less amounts of phosphorus, and iron, and traces of sulphur, magnesia, iodine. These earthy salts and metals are recovered after the moisture has been driven off and the solid parts incinerated—that is to say, burned to ashes. Of course it is not known that these ingredients existed in the living body as so much chloride, iron, or phosphorus—that form may be in part, or wholly, the result of chemical changes set up by the combustion. It probably is so as to some of them.

Now quantitative chemistry aspires to rank as an exact science. It is just now far from having exhausted the field of knowledge with which it deals, but so far as it goes, the friends of a rational diet may welcome it. One chief result of its explorations into the world of organized matter has been to establish the belief that there is nothing to be found within any living organism except what has come from the elements around it. There is nothing in the human body but what has been put or taken there. This is what might have been guessed in the cases of these analyses of human bodies. There have been but few exhaustive tests made, nor do these cover a very wide range of the varieties of men on the earth. They have generally been remains of criminals who have died in prison, or of soldiers who have died in hospital. Probably half dozen would cover all the cases in France, Germany and England. These men had been fed on the diet which custom sanctions. All had eaten salt. What more likely than that when their remains were cut up and burned in a retort, or dissolved by strong acids, the salt would be found there? It was not gaseous so that it could be exhaled through the skin or lungs; it was not fluid, the water being first evaporated from it; is it any marvel therefore, that it should remain among the incombustible solids—a residuum of the body?

If the same persons had been tobacco-eaters, and had the analysis been thorough enough, nicotine would have been found; or arsenic, had they been arsenic eaters; or lead, had they been workers in lead; and so on. Is there here any support for salt eating? I think not. Had the experiment been tried on a non-user, and had there then been found anything like the same proportion of chloride of sodium, there might have been an inference that it had either been gathered *from other sources* than the raw salt, or that it was manufactured in

the body. I am well assured no such result would happen; but if it did, as before said, it by no means follows that our knowledge of the properties of matter is so exhaustive that we could say the solids contained in the ashes existed in the same chemical combination in the living system, nor that both chlorine and soda may not be further decomposed into constituent proximate elements. But laying this feature aside, how poor is this foundation for a habit of diet! With as much, or more, reason might we sprinkle crude phosphorus, or (as is actually the case under the guise of peptones) the combinations of phosphorus and other salts, on our food and insert it in the preparation. So of sulphur, lime, magnesia, iron. Whence, I pray, does the body get its supply of iron? and why may it not get its supply of chlorine and soda from the same sources, if any be truly needed?

Suppose, for the sake of illustration, we admit that salt is a necessary constituent of the body (a proposition which, of course, does not admit of strict logical proof), we can turn right over to the same chemistry for the proof that it exists in sufficient quantities in the roots of vegetable edibles and fruits. Why not, as the birds do, obtain it in that way? I should not waste space on this branch of the subject but for the important fact, now coming to be accepted as truth by school-men, that not only is salt not food for man, but that it is no exception to all other earthy and inorganic matter. It is now recognized that the unorganized earths are plant food, and that while they are the proper and necessary aliment of vegetation, they cannot become a part of the cellular tissue of animals without being first organized as the cells of plants. Singularly enough the use of salt is urged by some writers who utter this doctrine. So that I think it will be demonstrated in a few years that of the few raw minerals which are now used as food among civilized men, none of them are susceptible of assimilation, incorporation and growth as living tissue in the body, but that so far as they act at all they are obstructive, hurtful, some of them being even dangerous. If this be so, how important that the bearing of the salt-eating habit should be understood, and equally, or even more so, the consumption of soda, potash and their various combinations under the name of "baking" or leavening powders, as if they were harmless? I am aware that in this position I am liable to be pointed to the organisms on the confines of the animal and vegetable world, which, like the coral and the sponge, do absorb and excrete these substances copiously, but it does not shake my position, inasmuch as it may be the vegetable structure which absorbs and the animal which excretes.

So far as the fifth plea is to weigh, it fits in with all that has been said above. It is conceded that salt-fed cattle will increase in weight faster than those without it, particularly if confined in stalls or stables. The experiment of Boussingault has settled that—and it settles nothing more—by no means justifying the inference sought to be drawn, that hence it can be made to substitute food itself. It is just what might be expected from the known action of salt on dead meat. Chemistry is a noble science, entitled to great respect, but like some other sciences, it must be handled with care and caution, or it will lead to absurd conclusions. The difficulty is not with the science itself, but with that which fastens upon it and travels under its name. The instrument itself does not deceive, but the fallible mind of him who wields it is prone to self-deception. We have an example of the mistakes of scientific men of reputation in the now exploded notion of Baron Liebig, that he could boil down the nutritious principles of an ox into a quart cup, and that the concentrated aliment would confer strength upon invalids. Years of trial show that patients will starve to death on "Extract of Beef."

Were we content with what Boussingault's experiments did show, and there stop, without drawing incorrect inferences therefrom, we should not have this spurious science to cast aside. The trial showed indeed, that ten cattle salted and fed alike in other respects gained in weight some 40 pounds average in about 100 days over ten un-salted, and that otherwise both classes were equally in good health at the end of the time. The same thing, for a limited time, might be shown on ten human beings, who were not diseased to begin with; but that salt will continue to promote fat is notoriously untrue, as is witnessed by the emaciation of victims of salted food on long voyages at sea, where scurvy has set in. It is noticeable that the same claim is made (the last stronghold of so-called scientific defence, I perceive) for alcohol—that though not food itself, it may be made to serve the same purpose. That they do accomplish the same result, though in different ways, it will be my aim presently to show. Of course, the intelligent physician, though he were a gourmand, will not confound an increase of weight with an increase of muscular tissue, nor with an increase of power, or even an increase of health, or hold upon life. We know fatty and interstitial degeneration is a symptom of tendency to sudden death either of animals or men. If salt conferred flesh, American men and women ought to *revel in plumpness.*

While I was pursuing my studies on this matter, a fellow student,

whose brother was a professor in one of the renowned medical colleges in Germany, requested of him the best arguments for the use of salt in food. The remarks, when they arrived, were found to be only an amplification of those known to our newest text books, namely: that it was a retarder of the combustion of tissues. In other words, that it arrested the metamorphosis of the matter of which a living body is composed. This position was supported at great length by observations with the microscope, on the composition, texture, and movements of the corpuscles and discs of the blood, membrane and vesicle, from which the solids are built up, and from an analysis of the venous blood after it had passed through the capillaries. The net result of all was that the osmotic processes, both for nutrition and decay, were delayed, and this was insisted on so fully as to suppose that by establishing this point, the utility of salt flowed from it naturally as a corrollary. This is the ablest, that is to say, the most ingenious reasoning I have met on that side; but it is convincing only the opposite way. It accords perfectly with my own conviction of the action of salt, and other pungent earths, on the tissues of animals.

It is one of the charms of the exact sciences, that they do not depend in the lightest degree on human testimony, or on the dictum of man, however great or learned. So, when any great discovery is made it is made once for all: all persons having the natural powers can go the same path and reach the same end. The matter proves itself as often as it is attempted. So when any advocate of a particular theory in biology gives his facts and his reasons, another can follow him and testify to their correctness, if that be possible. It seems to me the advocates of the use of alcohol (like the few who have a word to say for salt) have furnished us with an example of what ought not to be taken on trust when it is susceptible of better proof. Admit the offered facts that salt retards decay; what then? Have we got any nearer the goal? Ought decay to be retarded or hastened? Is not an interference here an interference with the most vital of processes? Before an atom of live tissue can be added to a part (growth excepted), an atom of dead must be removed to give it place. This is the very measure of life, and to maintain an equilibrium between decay and repair is the perfection of health. We can afford to take the broad ground that any and all interference with this function of the cells borne along in the blood, is to that extent baneful to life. The contrary hypothesis is held regarding disease, I know, but it is doubtful if, except within narrow limits, concerning

the mechanical function of distribution of blood, it is not everywhere an error.

We know that the antiseptic property of salt, its affinity for moisture, makes it valuable in the arts for some purposes, among which, of course, are conspicuous the preservation of dead animal meats. We see its effect in the beef or pork barrel, or on the dried fish. It hardens and keeps dry the fibrous tissue so that oxygen enough cannot be reached to oxidate and break down the tissue by what is known as decomposition. If the salt were all withdrawn by solutions of water (whatever might be the effect on the meat itself) there would ensue no harm in its use in preserving food. Notoriously it is not done, and even greater is the necessity for removing the nitrate of potash with which the curing is assisted.

Is not the action of the salt in the system on the effete or dying tissues, the same, in kind, as upon those in the brine barrel? I see nothing in the vital economy to negative the presumption. The particles of dead and oxidized tissue on their way out of the body, so far as they are brought within the influence of the salt—and this, as it floats in solution all over the body with the blood, must be general—are robbed of their moisture, dried, hardened, pickled, and their passage along the finer canals made more difficult. They lodge and remain, and hence account, in part, for the increased weight of the body. The added weight represents in part filth which ought to be outside of the body, not inside.

Its action on the living tissues I have good cause for thinking is more serious, though it requires considerable nicety and purity of sensibility to make it so apparent to the five senses. Wherever the briny solution comes in contact with the living portions of the body it requires a positive expenditure of energy to repel its irritating power. I do not now speak of its stimulating property. Every expenditure of power in this way is so much taken from the accumulated stock. Such is the affinity of salt for water that whenever it is present it will draw the water from the surrounding parts. In this way many of them are left without sufficient oxygen for the purposes of combustion. The oxygen in the blood is, in part, held by the salt. The decay, or breaking down, being arrested, repair, and *a fortiori* growth, is more difficult. I have in my mind several youths whose growth is stunted, as I believe, from the excessive quantities of salt, long used in cooking their food, and voluntarily added to it. To this course also may be traced many dangerous forms of disease, *such as rupture of the* blood vessels of the brain, as in apoplexy, or

of the valves and tubes in the region of the heart, by an inordinate pressure upon them. The continual saturation of the briny *liquor sanguinis* has so pickled the muscular and inner coats of the blood vessels that they have lost their stocking-like elasticity; they become tender and break easily.

There are certain other forms of disease connected with depravation of the blood, and the deposit of its solid contents in cavities of the body, which bring me to consider the seventh proposition concerning the action of salt on the secreting and excreting organs of the body. It is a capital illustration of the slip-shod manner in which some of the gravest problems of human concern are treated, to observe the remarks of our eminent physiologists on the action of salt as affecting the saliva and the bile, and is suggestive of the need of some such new departure in this department of science as has arisen in the cognate branches of astronomy, geology and comparative anatomy. Analysis of the human saliva (presumably that of salt-eating subjects), shows that it is strongly impregnated with hydrochloric acid, that element being derived from common salt. Chlorine is a gaseous substance having so powerful an affinity for many other substances that it is with difficulty kept in its pure state. It is the chief of the elements which, combined with sodium, form common salt. It is, in its pure state, deadly to inhale. Hydrochloric acid is a compound of this chlorine with hydrogen; and hydrogen is one of the constituents of water, and is necessarily present in all parts of the body. In the language of one of the treatises, the atom of salt is "split" into its component parts by the action of the ptyaline and alkaline secretions of the mouth, the chlorine being united with the hydrogen of the moisture of the buccal cavity, while the soda or earthy base, with so much chlorine as remains, is carried on into the stomach. The saliva is a copious secretion, and was found heavily charged with this compound of chlorine in such experiments as were made.

These are the simple facts. Now for the inferences. In the first place, it is assumed that the salivary secretion which has been subjected to analysis was the normal, healthy secretion, which is a case of begging the question, as that is the very point to be proved. It is, rather than otherwise, disproved by the fact that in many different analyses the proportion of hydrochloric acid is not constant, and before we can predicate normality of its presence it would be desirable to know what amount would be the true healthy secretion —all the *rest being* variations from it. In other words, why should

we not assume, as we shall presently endeavor to prove, that this secretion, like most of the others of the body, may be depraved and become abnormal from the presence of the foreign and poisonous action of salt?—so that, in fact, instead of an analysis of a healthy secretion, we have been examining an unhealthy one, and from the results so obtained promulgating a rule for preserving or promoting health. Singularly as it may sound, this is just what has, I believe, been done, not only in regard to the saliva, but also in regard to the mesenteric and hepatic secretions. But while it is by no means certain that this element is necessary—certainly not in any such proportions to the necessary function of the ordinary glands—let us assume that it is, and ask, why may it not be drawn in sufficient quantities from the foods which contain it in an organized form? Experience teaches me, that so far from being an aid to the glandular bodies, it is a *stimulant* to their function, and as such, destructive to them—especially when enfeebled by disease.

It is altogether probable that the hydrochloric acid, under the action of the chemical rays of light, would be separated from the salt so taken in under organized forms, and that a trace of it would be found in the saliva of a non-user of said salt. But, like the presence of many other ingredients, it cannot be safely assumed to be necessary or beneficial. It may even be the reverse for all we know at present; and further investigation may go to show that the less of it the better for health and vigor of the secreting organs.

But on the supposition that it is a necessary ingredient of the saliva, does this justify the saturation and sprinkling of our food with large quantities of the solid salt to supply it? Where, for example, do the animals that never taste salt procure their saliva? It is known that the saliva has a circulation of its own; that after commingling with the food in mastication, it passes into the stomachic cavity and is there re-absorbed by the capillaries of that organ, and is taken back, by a shorter circulation of its own, to the vessels supplying the parotid and sub-maxillary glands without going through the entire circulation of the system, so that the same constituent elements are not lost but re-appear again and again. So that if necessary the supply would require to be but slight. Now this is precisely what might be expected of a non-essential and floating element to do. It happens continually of other excretory products, that if they do not promptly escape by the predestined avenues they do appear and re-appear constantly, yet nobody pretends that this uniformity of *their appearance is a proof* of their necessity and utility.

A little conscientious personal experience is sometimes worth a great deal of pseudo-scientific reasoning. I have often thought that if our noted men of science would exercise the same diligence in showing that the besetting weaknesses of men are hurtful and needless that they do to prove them tolerable or beneficial, there would be a hope of a better generation of men, than we now have, with an improved society. It seems to be fated that so long as there are physiologists who themselves take alcohol or prescribe it to others (and the same is true of tobacco and salt), and so long as there is a vast concentrated capital invested in the manufacture, distribution and sale of it, so long will there be found "eminent authorities" who will seek for proof and reasons that it is good or necessary for mankind. Six months of abstinence from using either of these stimulants will be of more utility, if carried out in good faith, and with an eye to the truth alone, than any number of authorities. It is the testimony of many with whom I have conversed, and of those of my own household, who were unwillingly led to make the trial, that not only are the salivary organs more prompt in furnishing the supply of saliva, but its quality and solvent power are improved. This is shown in the other direction by a comparative loss and feebleness of the gustatory powers of high livers; and the experience of hygienists when by uncontrollable circumstances they have been thrown on the salt-mixed food which is common when away from their homes. My domestic servants, without knowing the reason why, complain that the food they get of others is not palatable and does not agree with them.

The same argument is made, but it seems to me with vastly less effect, in regard to the bile. Cholate of soda is a prominent constituent of the bile, as is found by analysis. Aside from the ingestion of soda, in its carbonate form, as it is used in "baking powders," so called, and for leavening purposes in bread and cakes, so painfully prevalent among us, the presence of soda in combination with other salts in the body is easily accounted for. We have just seen how it is derived from common salt. One trouble, as I have indicated in regard to the saline ingredient, is that we cannot be sure, under our methods of analysis, of the normal experiment. From the very sources whence these *cadaver* are derived, they are prone to deviate from the typical man. So of the domesticated animals; their very attributes which fit them as subjects for the scalpel, imply more or less corruption of natural tastes, or of disease, or both. But setting this aside, let us take the evidence as it is given. It was long a

disputed question as to whether the liver was a secreting or an excreting organ. Latterly the weight of authority inclines to the theory that it is both, and the dispute is now only as to the degree of secernency and excernency. I think I see the way to account for all the admitted facts, to reconcile these two views, and at the same time to show that in health its action is throughout the same in character; and that in disease its manifestations are liable to take on apparently new forms and new functions. This is not, however, the place for their expression.

It is admitted on all hands that the liver is the largest gland in the body, and that its function, if not wholly, is chiefly depuratory. It is concerned largely with the purifying of the blood, and fitting it more perfectly for the purposes of repair and drainage. I think it would not be difficult to show that the effect of irritant or corrosive minerals on all the glands of the body is directly to diminish their powers, and if persisted in to impair the integrity of their structures; and this is as true of salt, which has come to be regarded as a food, when it is really a drug, as it is of the more acrid substances which are being administered for nervous manifestations of disease by the head lights of therapeutic practice. It is only necessary here for me to call attention to the fact that salt is a common ingredient of all the solid or fluid excretions of the human body. This is as true of those ranked as normal as of those truly morbid. The fœces, the urine, the sweat, the tears, are all salty—much more so, be it noted, among salt eaters than among abstainers. There is no rational doubt that it is one of the chief functions of the body to extrude salt outward, by every one of the emunctories. This is acknowledged to be the case with sulphur, the only difference between our apprehension of the process as between sulphur and soda being that one is much more palpable to the senses than the other. If I were inclined to frame an *a priori* argument, I might say that that substance which is only put into the body to be promptly put out again without vital incorporation, has, *prima facie*, no business there.

We can reach the same conclusion another way. Believing that the argument, from design or intent, has no place in a discussion of physiological functions, I need not resort to it. The structure and substitutive nature of the functions of the great cleansing organs, the skin, lungs, liver and kidneys, point, even on the theory of evolution, to the same conclusion: that the materials strained from the blood are found in it, and for those which promote its welfare, organs of *absorption have been* developed, and a differentiation in function

between those which are clearly excretory and those secretory has been, in the course of countless generations, set up in man, and the course by which they have reached it may yet be discerned in the lower forms of animal life. It is assumed because the bile is poured into the upper part of the intestine and is mingled with the chymous mass of the food, that therefore its function is to promote digestion, and also that the soda in the bile contributes to the digestion of the fats in the jejunum and ileum, by saponification. Hence the beneficence of salt by supplying soda to the liver.

The deduction is far-fetched, and goes upon two unsound legs, beside; in the first place it is not established that the bile is necessary to digestion. I point, incidentally, to one fact of contrary import, that in the fœtus the liver is not only larger in size but also more active in functions than in post-natal life, and ask of what use the meconium, or bile, poured into the upper intestines, can be toward digestion of the child, where there is no digestion, primary or secondary, to aid?

In the next place, neither is it true, nor indispensable, that this saponifying process should go on for the perfect assimilation of fats. May it not be, is it not, in fact, a retardation of their absorption? I am aware the contrary doctrine is held and taught, but it is so on what seem to me entirely insufficient grounds. In a word, the prevailing theory of the operation and processes of the conversion of hydro-carbons is incomplete and unsatisfactory. There is such a thing as a plethora, as well as a deficiency of carbonaceous matter, both in the blood and in the lacteals and excretories, and this plethora is in no wise relieved by the salts and alkalies which combine with it, either mechanically or chemically, to the detriment, rather than the benefit, of the life process.

This accounts, to my mind, for the action of the soda on the bile, its union with the cholesterine being one of the deleterious products to be thrust out of the body, but which by morbid conditions is commonly not done, hence the repeated circulation through the liver. I am the more confirmed in this view because the same mineral base is found in all the normal excreta as well as in morbid secretions. No one will pretend that urea or its vehicle is a secretion. Yet urate of soda is a common ingredient of the urine, and of the solid secretions known as stone; and the source of this is partly in the ingested salt. The rheumy mucous excretions of catarrh contain the same thing, and I am satisfied those of the cutaneous eruptions and rashes do also. But what is far more convincing is

the composition of the excretions due wholly to diseased action of the organs. In dropsy the serous effusion is found to be highly charged with some combination of soda, noticeably the lactate, a compound of lactic acid and soda. This lactate of soda (so named, not from its origin in milk, but from its similarity to that so derived) is derived from the decomposition of the muscular tissues, and amounts to as much as ten per cent. of the solid residue of the liquor of ascites and of goitre—showing that wherever we have the action of salt, and its base soda, in the body, it is as an effete product on the way out. This is always the case in disease; and in the single instance of the saliva, where the contrary might be supposed, there is doubt about the propriety of its presence.

This brings us to the last of the defenses of salt users. The chemical arguments, if thoroughly tested, will, I am confident, give no support to the habit, but will help ultimately to overthrow it. If it is not justified by the eighth hypothesis, it is not at all. If salt has no value as an appetizer, then it has none. There is a homely and ready way of meeting this, which is to the effect that whenever a person needs something put on good food "to make it taste good," there is something wrong with his appetite or his taste. This is true physiologically. Hunger is the natural, the best, sauce. Whoever misses this and seeks to tempt himself into eating without this grand appetizer, had better look out for trouble. I do not doubt that a large amount of sickness is encouraged by the very satiety engendered in this way. Approaching the subject from the other direction, however, a little experience is worth a good deal of philosophy. Any one may make the test, and he will find at the end of from one to twelve months, according to his physical condition, that not only is his appetite more prompt at call, but also more obedient to the will, and at the same time his food will be more palatable than before. Not only are the deadened nerves of taste revived and strengthened, but also made more delicate than ever. They are in fact grown anew and of better quality. The hearty relish of boyhood can in this way be regained. It was among the most enjoyable experiences I encountered, to find that I could, when fairly weaned from my salt habit and purged of its effects, discover new and unexpected aromas and flavors in the food. This has also its other side. I could detect unpleasant and repugnant qualities where I had never suspected their existence. For example, I could detect the salt in baker's bread as well as the yeast. The first two weeks or so of abstinence are, of *course, accompanied by* a feeling of tastelessness, but this—especially

if hunger is invited—soon wears away, and before long the abstainer will be able to relish all the wholesome viands unseasoned better than he ever did. This is true throughout, and applies even to those three crucial articles, boiled eggs, boiled beans and baked potatoes.

A noted advocate of Diet Reform, when asked the meaning of that passage of Scripture concerning the "salt which hath lost its savor," happily replies that whenever the taste is so deadened that it is necessary to put more salt on to produce the same effect, then it "hath lost its savor." Whether this is the true rendering of the passage I care not; it expresses what is the natural fact. As he is accustomed to say, if there were no other argument against seasoning food with salt, pepper and spices, this one alone is sufficient to justify abstinence. It is a habit which grows till it enslaves and then destroys the taste and smell. More and more pungent has the dose to be made, as the palate becomes hardened and thickened. There are other effects, baleful enough, to be presently considered, but looking solely from the stand-point of the amount of gratification to be derived from the contact of the food with the palate—a low ground to be sure, but a potent one among the good-livers—even from this view, it is a folly to resort to condiments. They, in the end, like all artificial attempts to heighten the pleasures of sense, not only fail of the object, but also ruin and put out of range the power to secure their reasonable enjoyment. Saying nothing about health therefore, as a mere sensual indulgence, I regard salt eating as a delusion.

To review the argument then, I dissent from each and every proposition advanced by the advocates of salt-eating. Were I to formulate a series of propositions on the subject, with my present knowledge and convictions, it would be as follows, every one of which I think can be sustained by more credible and more strictly scientific evidence than those we have just reviewed:

I. Salt eating is not a natural, but an artificial, habit.

II. The great mass of animals do not eat it, but reject it; it is fatal to many and is probably conducive to many pestilent diseases among the domesticated kinds.

III. Human beings can live to good age and enjoy good health without adding it to their food; and they sicken and die from a persistent excess of it.

IV. It is no more necessary to the human system than are phosphorus, lime, sulphur and other substances, and if a critical analytical

comparison could be made it would be shown not nearly so much so.

V. It is known to be present in all the excretions, but its presence in the single secretion, the saliva, is of doubtful value.

VI. It interferes with and retards the conversion of the blood constituents into tissue, and conversely, with the degradation of tissue into waste matter, and in so doing obstructs two important laws of repair and growth.

VII. As an appetizer it is a mistake, not only demanding more and more gratification, but finally destroying or greatly injuring the nerves of taste.

VIII. It is provocative of disease in manifold forms, among them the nervous disorders leading to the tobacco habit, and the still more terrible craving for alcoholic drinks.

To those who may follow the line of inquiry here suggested, a few directions, though imperfectly given, may be of service. It is sufficient to indicate that the salt-eating habit can best be dropped by abstaining also from all other noxious or stimulating substances. In other words, one should "live cleanly;" that is to say, put nothing inside of the body, either as food or medicines, except such as will make good blood. Among these interdicted substances are, of course, crude minerals of all kinds, alcoholic liquors, tea, coffee, condiments and drugs. Pure, soft, living water only for drink, and only so much as thirst requires. I have given considerable attention to the habit of my fellows of late years, and the apparently irresistible propensity of all lovers of highly spiced foods and strong drinks to rush from their meals to a cigar or a chew is, I think, among the secondary effects of salt eating. The incessant thirst for ice-water rampant among a class of Americans has, I believe, the same origin. The passion for the mixture called "ice cream" among our city folks may, in part, be attributed to the same cause.

It is a little singular that no one is ever found willing to confess himself or herself, an immoderate salt eater. There is no standard set up, even by the writers on diet; but in practice each one is a law unto himself. I have seen boys and men who emptied the ordinary salt-cellar, containing say half an ounce, at a meal, but no one admitted that it was more than was good for them. A good many parents urge on their children the increased use of it (while but few check it), in the belief that it is a preventive as well as antidote of *intestinal parasitic worms*. The severest cases of this kind that have

come under my observation have been among salt eaters, while of the abstainers not a single case has occurred, so far as I learn. If it be true, as I have no doubt, that such parasites live on the decomposing matters of the blood and tissues, their presence is accounted for more satisfactorily in the obstructed bodies of salt eaters.

I think it will be conceded by the most candid physicians, that there is something fundamentally wrong about the food we eat in this country, or in the manner of preparing it, or both. We have in the United States more dentists than all the rest of the world put together, and worse teeth than any other people. It demands a severe scrutiny to ascertain the cause of it, as it so closely concerns one of the great processes of digestion; and the trouble, besides growing worse every year, is transmissible in compound ratio. Without teeth, we can have no perfect digestion, and without that, farewell to a race of vigorous men and women! We shall inevitably, in spite of our great advance in knowledge and civilization, fall a prey to the spoiler with sound teeth; we shall become an extinct race. I am not able to connect this great ravage exclusively with the salt-eating habit, but in common with the various compounds of potash known as saleratus, cream of tartar, and the like, which are even more deleterious, I imagine that a connection of cause and effect may be traced. I think the compounds of soda, used in the preparation of food, drug medicines, and the more prevalent use of common salt, may also have something to do with it. The presence of one element of it, the hydrochloric acid, in the vascular circulation of the mouth and permeating the mucous capillaries from which the bony structure and the enamel of the teeth are derived, though not conclusive, points to it as a probable cause. This is somewhat confirmed by the fact that the decay of the teeth has been arrested after the disuse of salt, along with the other mineral substances above named. It is true this commonly happens along with other dietary and sanitary changes and may be due in part also to them.

I desire to notice, however, the fact that salt is used on those articles of food most copiously which the natural appetite and Comparative physiology as well as Chemistry indicate as the least serviceable in point of vital economy, and the most perishable and costly in the eye of political economy. The fruits require none, the simple cereals but little, even by those who habitually use them—eggs, butter, mollusks, fish, flesh meats the most of all. It is notorious that the made dishes abound in it, and when the American cook is in doubt whether his soups, ragouts and side-dishes are palatable, he

adds a little more salt. We have as a consequence a wholesale deterioration of national taste. The popular books on cookery rely upon it to make savory the most of their dishes. Many of our prized dishes are execrable compounds which a pig would reject.

Salt is a powerful irritant; some say, an irritant poison. That is a question of definitions. At any rate it is a stimulant, and therefore hurtful. I do not shrink from the broad proposition that stimulation is exhaustion, everywhere and always. A teaspoonful of salt administered to a young child or to a non-eater of it, will increase the pulsations of the heart full ten beats a minute. This is never justifiable. It is prodigal and wasteful of the vital energies, than which nothing is more precious to the individual or nation, and compared with which squandering of material riches is trifling. The primary effect of salt on the nerves of the body any one can test, by placing strong brine upon a skin wound or ulcerated surface. There is a sharp, corrosive irritation, causing writhing of the nerve fibres and filaments, and great sense of acute pain reflected back from the nerve centers and ganglia. Were we able to measure the expenditure of nerve force in its passage, we should find a rapid waste in every such experiment. The action of the brine (who can doubt it?) is essentially the same on the nerve tissues of the inner as upon the outer skin, though the degree of sensibility outside may be greater. Consider for a moment, the effect of a briny solution upon the lesion of an inflamed mucous surface of the stomach, the intestines or the lungs! Yet this is actually what takes place among salt users. The liquor which floats the blood corpuscles about in the body, and which on its return to the heart floats also the oxidized debris, floats also, in suspension or solution, more or less of the salt granules. These, wherever they impinge on the exposed nerve structures, set up the same kind of irritation, the degree being in proportion to the quantity, and this process may go on all over the body, including, of course, the brain itself. The finer the vascular tubes the more exposure. This collision goes on until the irritating substance is removed, or until a cushion or envelope of mucus is interposed. To this cause may be attributed very many nervous disorders, including those peculiar forms of disease common to American women—hysteria and sick headache. I notice also a continued unrest on the part of salt eaters, an uneasiness and lack of repose, which an abstinence from all stimulants will soon allay, but *which all the art of the* druggist never yet has done permanently. I *never yet knew a rheumatic* patient who was not an eater of salt or

soda. The deposit of what are called "lime lumps" under the skin I have noticed among great salt eaters. That the deposits of calculi in the kidneys and bladder have been made while the habit was continued, and disappeared after it had been abandoned, I can personally testify. One event followed the other with such promptness and closeness as to suggest—though it may not be strictly proof—the relation of cause and effect.

If chloride of sodium were not so extensively used in the arts, and did not enter as food so largely into commerce (whose guiding principle is gain, not conscience) we should regard it as a drug, which it properly is. Like alcohol, it should be relegated to the chemist's laboratory and artisan's work-shop, where alone it belongs. It does untold mischief in spreading and fostering disease, and in retarding recovery. Four years' experience has given me an interior and personal conviction, which no reasoning can shake, on this point. It is my misfortune to have to be from my home at times, where, in spite of my purpose, a little food into which salt has been put in cooking, is eaten. Divesting myself as well as I am able of subjective bias, I always feel that my progress toward health has been slackened thereby, and is proportionally hastened again when I can have the benefit of food absolutely saltless.

I have been asked the question: Would you advise one who has always used salt on his food to abandon it suddenly and altogether, or to break off by degrees? My answer is: That depends more on the person than on any external circumstance. No general rule can be framed for every case. I can concieve of cases, of enfeebled persons, who had a good prospect of speedily gaining strength, where relative benefit might be had by the gradual disuse. But in the majority of cases "swearing off" abruptly, is not only easier, but it has several advantages also. It shortens the struggle, and the revival of the sensory pleasure is quicker, and except in rare cases, the inevitable constitutional changes are undergone when the system is best able to bear them. This, however, is a question in which the convictions of the patient, and his state of mind, have so much to do, that for the mass of mankind, as we are brought up, it is one in which the counsel of an intelligent physician who is himself an abstainer, may be sought with advantage. For all those not already in the decline of life, or permeated by organic disease, it would come as near universal application as anything, to say that the sooner wrong-doing is stopped and right-living begun the better.

I am also asked the question: "If I stop using salt am I not in danger of bringing on a fit of sickness, which may endanger life?" Unfortunatetly there is not as much option in this matter as the question seems to imply. It might pertinently be answered by another: "How can you be sure that by continuing you will not invite a fit of sickness which may be so much the more severe, or even fatal?" There are no exemptions or guarantees in either case. The chances would seem to be in favor of giving nature free play at the earliest moment possible. To use a sharp but not irrelevant comparison, the case of a victim to the salt-eating habit resembles that of a confirmed inebriate, he has the struggle for existence before him, and his chances of survival are greater with one less enemy to contend with, and he may succumb in any event; or like that of the sufferer from stone in the bladder, who has a choice of submitting to an operation of lithotomy, or of enduring the ailment; but who cannot, therefore, be said to have the option of long life by simply putting off the surgical operation.

A word of precaution in this connection may be useful. If, as has been shown, one of the properties of salt be to retard and hinder the necessary molecular change of tissues, and to require an expenditure of vital energies to resist its irritating attack, it follows as a necessary consequence, that to discontinue its use will set these transforming agencies at their natural vigor of work. Decay, or degradation of the solid parts of the body is accelerated, and after a time, the complementary process of upbuilding or repair follows, accompanied by the sensation of hunger. This change is frequently so marked and rapid as to cause loss of flesh or rather of weight—for one loses nothing but what is an advantage to be rid of. For corpulency or obesity this is vastly to be preferred to Banting's "dry cracker and glass of sherry;" and of course more reliable than the "anti-fat" patent medicines. It ought to cause no surprise if the stoppage of salt eating should, in case of long standing, result in such changes of the system as to produce comparative weakness, as it does at times, going so far in much beclogged persons, as to prostrate them with eruptive, or intestinal disease for which rest and great care, together with free play for the healing efforts of Nature may be advisable or even necessary. These, however, are curative, purifying exertions, which would have come in time, salt or no salt. All that the disuse of salt has to do with them is to allow them to begin in *full play at once*. The question for salt-eaters seems to me to be *rather, not "how* can we safely make the experiment of cessation?"

but, "how can we hope to live out the full term, to which our organization entitles us, unless we do?"

It is related that the peasants of the Styrian Alps are addicted to the habit, when in youth, of eating the salt of arsenic, a chrystalline mineral substance which, like the chloride of sodium (common salt), has a metallic base, and has much more powerful corrosive, and antiseptic qualities. It actively arrests the decay of animal tissues and hence has been employed in solutions for embalming purposes. It is also used largely as a preventive of fever and ague; and more or less clandestinely, by horse dealers and stablemen, in "condition powders," and as a means of giving fat, and sleek coats to horses. There is a tradition that it confers upon these Styrian young men and women, ruddy complexions, plumpness of outline, and great breathing power, which probably accounts for the strange habit. Whatever may be the first results of its use—and it is not easy to measure them exactly with our present information—there seems to be no doubt that when long continued its mastery over the victim is complete. Commencing with small doses, as might be anticipated, its effect on the system is feebler, and more and more is required to produce the desired effect, until doses of from 20 to 40 grains a day, or sufficient to kill a strong man unused to it, are taken with apparent impunity. This process cannot, of course, be kept up indefinitely; and when the time for cessation does come, as come it must, the dissolution of the body is near. This is the observed effect upon horses, which break down under its pressure, and break down rapidly when it is taken away. We have here, it seems to me, a practice to which the salt-habit furnishes an analogy, fainter, it is true, but essentially the same in character and manifestation. The same moral might be drawn, with perhaps even greater force, from the habit of taking alcohol, opium and its preparations, chloral hydrate, mercury, bromide of potassium, quinia, and some other poisonous alkaloids having a fashionable reputation.

In answer to all this, I shall be pointed to the many old men and women who have lived in fair health to a good old age, eating salt three times a day or oftener, and asked if that substance can be very injurious? The same question is asked in regard to tobacco, alcohol, tea, coffee, opium, and even of arsenic and other poisons. I reject the theory that the constitution of the individual may become accustomed or modified so as to make a noxious substance a harmless one, or make food out of that which is by its nature innutritious. Very great and remarkable is the recuperative and protective power of the

healthy body. Had it not been so, the race would long ago have perished, with the dodo, and we should not be here to speculate about it, having left a few remains in the rocks. It is admitted that human beings may take these several substances for a long life time, and if their cleansing organs have free play, as is apt to be the case in those having out-door occupation, the hurtful matter may be as promptly expelled as it is ingested. This is doubtless the true explanation, the condition varying with the degree of vascularity in the excreting organs. But this affords no excuse, certainly no guarantee for its use by less robust persons. There is a strictly logical and technical argument bearing on this point, which must here be omitted, in order to glance at the other side of the picture presented. It is this: Our attention is called to the few old survivors of the habit. They resemble the few old survivors of many battles. They survive, not because war is harmless, but in spite of its fatality. To give this argument its due weight we should also turn our eyes upon the greater number of their comrades who have been slain, or who have perished of disease long before, and note how small the proportion of survivors is to the whole. So, if we will take our stand at the gates of any of our city cemeteries, and reckon as they pass, the vast number of all ages who are borne through them, and see how few in comparison are the long-lived, no matter what their habits, more than half of all will be found to be children under five years. What was it killed this awful number untimely? You will say, exposure to the elements; they "caught cold," as the phrase is, took a fever, or some other ailment, which they had not stamina to resist. Let us push the inquiry one step further, and ask: Why had they not? The young Indians have, and so have the young deer; why not also the young of the white men?

It is asserted by statisticians that the average duration of life is as long now as at any historical time. Averages are deceptive as arguments in regard to diet; but suppose the average to be, by some prevailing error in national diet, diminished by half, there would still be some old whisky-drinking, tobacco and salt-eating veteran of thirty-five or forty for his younger children and grandchildren to point to as an instance of the longevity peculiar to those habits. Assuming that in the main, old and young, we are living as long as our forefathers, even if we are sure of its continuance, should we be content with that? Ought we not to try and do better, and seek for *those causes* which are shortening our average of life, and robbing us *of the full capacity for* living out our natural days?

I reserve for the last my most formidable objection to the use of salt at table. It is that, after much study, I am convinced that the foundation of the love for tobacco and intoxicating liquors is there laid. I have watched it with care, and every day strengthens this opinion. All the great drinkers, as well as the smokers *en masse*, are users of salt, frequently the ratio of the one keeping pace with the ratio of the other. That drunkenness, dipsomania, the thirst for alcoholic stimulus, is disease, affecting the solar plexus, and through it the sympathetic ganglia and so on to the cerebellum, is no new doctrine. Whatever may be the originating cause, I am satisfied that every indulgence of salt promptly sets up, and keeps up, this nervous irritation. Its clamors are so potent that within twenty minutes after a meal there is a demand either for the sedative influences of a narcotic, "to steady the nerves" by tobacco, or else for the more subtle stimulus of the powerful carbo-hydrate alcohol, which drowns the original unrest in a new set of emotions. That either of these influences on the nerves is wholesome would require great hardihood to contend. If it be true, therefore, that we sow the seeds of dissipation at our firesides, and engender the demon of thirst, which afterward claims its victim, by the way in which we prepare the food of our children, how appalling, how enormous, is the mistake!

Many will recoil from so damning a conclusion; but in support of it I offer this testimony: that while every means is tried in vain to conquer the vice of confirmed drunkenness, including physical and moral restraint, nothing is so effectual as the cessation of salt-eating. If the victim to it will only give his consent, and live on a diet of grains, fruits and vegetables, simply prepared and eaten saltless, for a year or eighteen months, I believe the most inveterate drunkard will be relieved of the thirst for liquor, provided the inroads on his constitutional stamina have not been so great as to do structural injury. Furthermore, so long as he lives so it will not return to him. I maintain, also, that it is impossible to induce the taste for alcoholic liquors among children or men who have lived a vegetarian life, and without salt. You can't make a drunkard of such an one. Will not anxious mothers and fathers, then, who see their youth growing up with this fearful temptation ahead of them, give the subject their earnest consideration, and give them a bias toward health and purity by removing from the family tables all those substances which tend to make them the slaves and victims of a false and morbid appetite, and which in the end drowns taste, reason and conscience?

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